

SELECTION OF MOST SUITABLE BAND COMBINATION OF LANDSAT IMAGES TO DEVELOP AN EARTH SURFACE RESISTIVITY MAP

A Egodawithana

Water Resources Board, Colombo 07, Sri Lanka.
Postgraduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka

Satellite images are playing an important role in the field of earth observation. Data and information given by satellite images are very useful in various kinds of fields such as agriculture, geology, land use mapping, Biodiversity conservation, forestry and etc. There are different types of sensors with wide range of resolution values in each satellite. Landsat, Geoeye, Quick Bird, ALOS are some satellites recently use. To analyze data given by the satellite images, there are some software also. Arc GIS, ERDAS, ENVI and ILWIS are some examples. When it comes to Landsat images, there is a sensor called ETM+ (Enhanced Thematic Mapper) with 8 bands. From these bands it can be gathered different ranges of wave lengths of the targets. Also it has 07 multi spectral bands with 30m resolution and 1 panchromatic band with 15 m resolution.

In the field of groundwater investigation, the earth resistivity values are very much considered. Soil moisture content and emitting radiations of different earth materials are vary from the place to place in the earth surface. Therefore, from the bands of Landsat satellite, it should be able to get an idea about the earth resistivity values.

For that purpose, nine band combinations were prepared and gathered actual ground resistivity values in 55 locations. 10 values were selected to the verifying process and other 45 values were used to classify the images with each band combination after categorize resistivity values in to 03 classes. Resultant images of the supervised classification were subjected to the accuracy assessment and the band combination with the higher overall accuracy was selected as the best band combination to detect the earth resistivity. In this study, band combination of 4-3-1 was with the highest overall accuracy (70%) and it was selected as the best band combination to determine the earth resistivity.